U.S. Environmental Protection Agency Underground Injection Control Program

Draft Permits and Proposed Aquifer Exemption at the Dewey-Burdock In-Situ Uranium Recovery Site near Edgemont, South Dakota

For the Region 8 Regional Tribal Operations Committee and Tribal Science Council June 2017 Meetings in Rapid City, South Dakota

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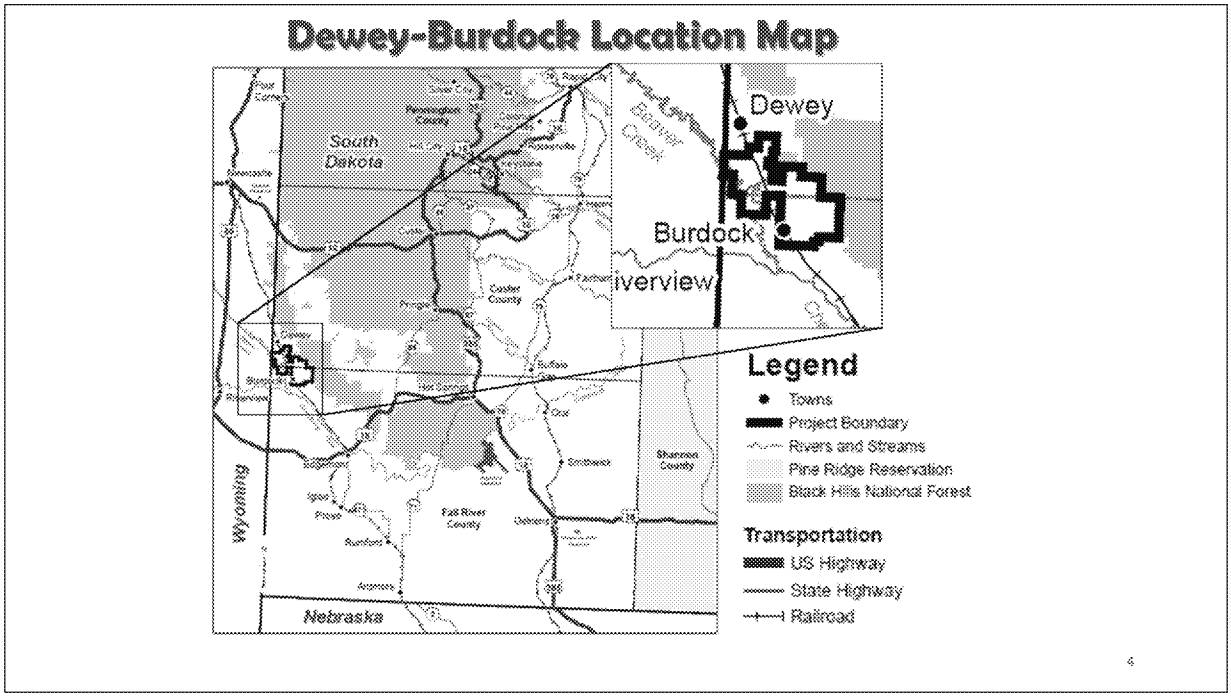
Background:
The Underground Injection Control Program

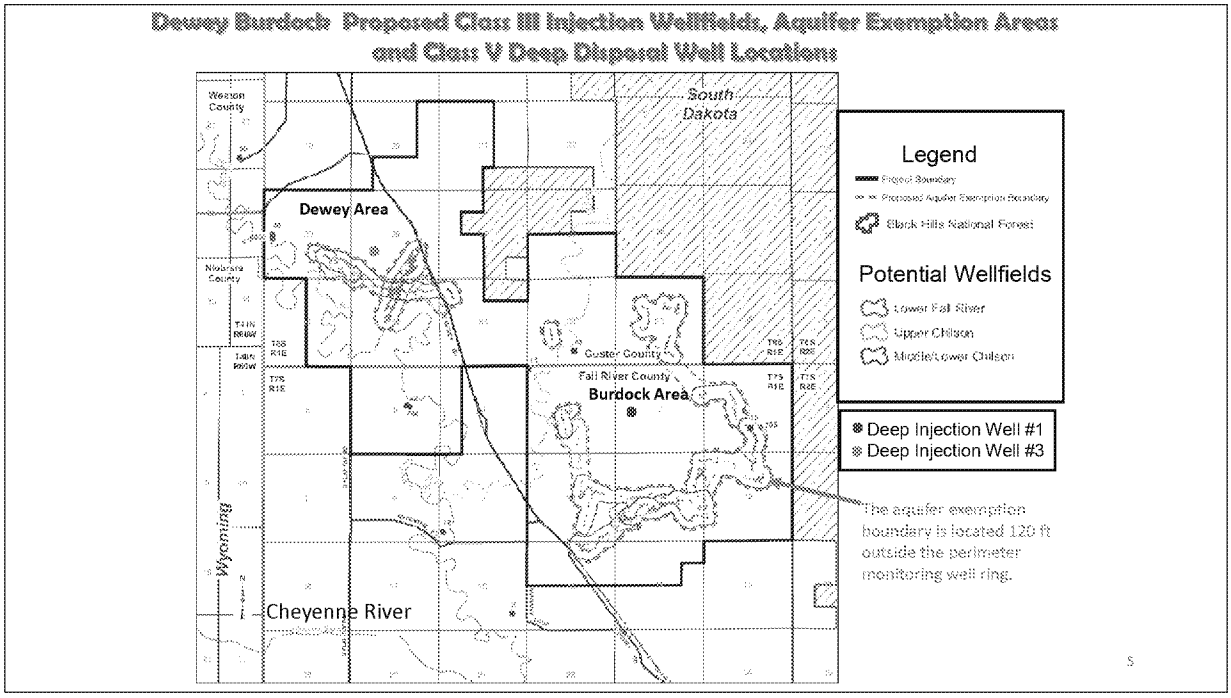
- Authorized under the Safe Drinking Water Act
- Mission: to protect Underground Sources of Drinking Water by regulating injection activity and injection wells.
- An "Underground Source of Drinking Water" (USDW) is defined by regulation as an aquifer (or portion)
  - Which supplies any public water system; or
  - Which contains a sufficient quantity of ground water to supply a public water system; and
    - Currently supplies drinking water for human consumption; or
    - Contains fewer than 10,000 mg/l total dissolved solids.
- Classifies injection wells under 6 classes based on type of injectate and purpose for injection activity.
- May exempt a portion of a USDW from protection under the program based on certain criteria.

The Dewey-Burdock UIC Permits

- The Region 8 UIC Program issued two draft area permits on March 6, 2017.
  - One draft permit is a Class III Area Permit for injection wells for the in-situ recovery (ISR) of uranium in Inyan Kara aquifers;
  - The second draft permit is a UIC Class V Area Permit for deep injection wells that will be used to dispose of ISR process waste fluids into the Minnelusa Formation after treatment to meet radioactive waste and hazardous waste standards.
- The EPA is also proposing an aquifer exemption approval in connection with the Class III Area Permit to exempt the uranium-bearing portions of the Inyan Kara Group aquifers.
- The EPA also released for comment:
  - a draft Environmental Justice Analysis,
  - a draft Cumulative Effects Analysis, and
  - a draft document explaining process and considerations for NHPA Section 106 Tribal Consultation.

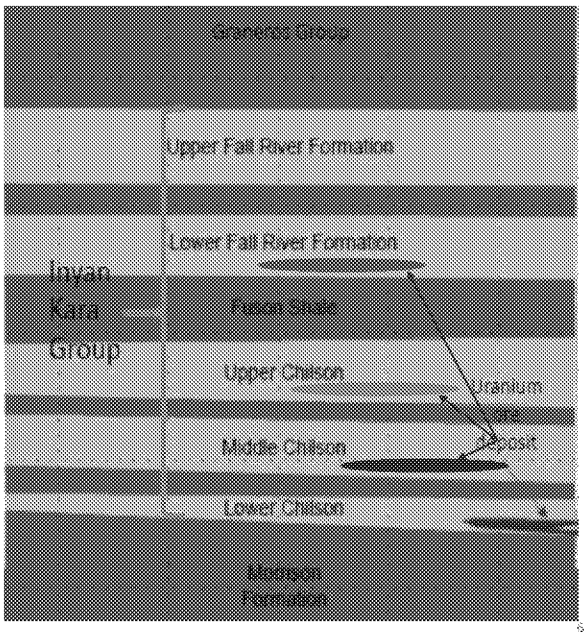


The Dewey Burdock site is located in the SW corner of Custer County and the NW corner of Fall River County on the Wyoming/South Dakota border. In the southern Black Hills. About 45 miles west of the Pine Ridge Reservation. Very close to Cheyenne River which is a concern for Oglala Sioux and Cheyenne River Sioux Tribes since the Cheyenne River borders their reservations.



This slide shows the location of the site relative to
SD WY Border
Custer and Fall River Counties
Point out the Cheyenne River, Beaver Creek (flows all years) & Pass Creek (flows seasonally)– explain there will be surface water monitoring of Beaver Creek and the Cheyenne River under DENR permit and NRC license
Point out:
Dewey Area & Burdock Area
4 proposed wellfields in Dewey Area & 10 proposed wellfields in the Burdock Area.
AE Boundary 120 feet outside of wellfield monitoring ring.
Locations of Deep Class V injection wells

Vertical Extent of the Aquifer Exemption Boundary



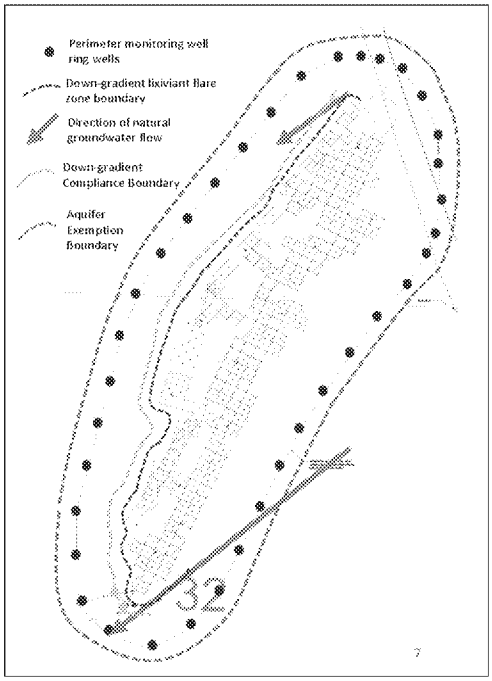
Discuss the vertical extent of the aquifer exemption
Explain the importance of the confining zones above and below the injection zones. The Class III permit requires extensive geological and hydrological testing to make sure these confining zones will contain the injection zone fluids at the location of each wellfield.

Post-restoration Monitoring

1. The Class III permit requires post-restoration monitoring after the restoration of the wellfield groundwater has been completed.

2. The purpose of the post-restoration monitoring is to be sure ISR contaminant do not cross the aquifer exemption boundary into the Inyan Kara aquifers down-gradient of the wellfields, which are still underground source of drinking water.

3. This is a new requirement for the ISR industry to make sure the down-gradient USDW is protected.



Explain wellfield restoration – NRC regulated. EPA regulates USDWs outside AE boundary
The RCRA unified guidance describes statistical methods for establishing groundwater baseline concentrations and detection of contaminants. These methods have proven to be successful over several years of use under the RCRA program.

Class V Deep Injection Wells

- This Class V permit requires the most protective well construction requirements under UIC regulations
- There are numerous requirements for rigorous geologic and hydrologic characterization to verify that injection activity will not cause migration of injectate into USDWs.
- Powertech must demonstrate that the Minnelusa is not an underground source of drinking water (USDW) in the area where injection is proposed.
- The Class V permit does not allow injection into a USDW.
- The Class V permit requires the injectate to be treated to below radioactive waste and hazardous waste standards.

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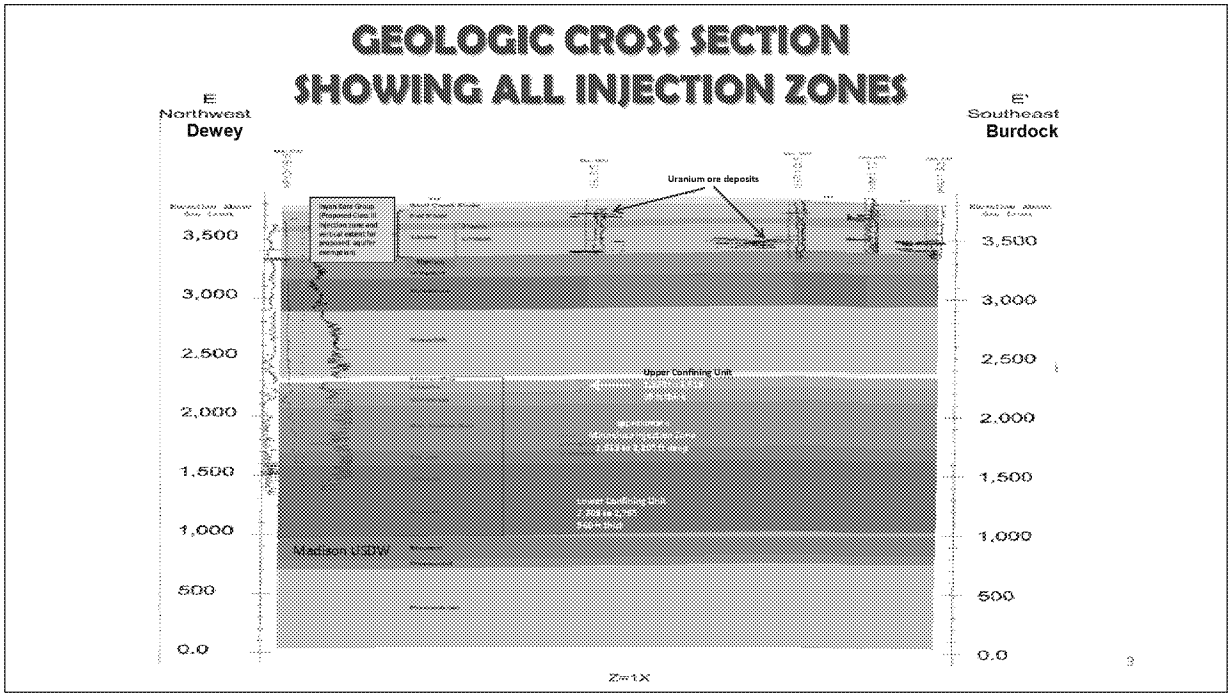
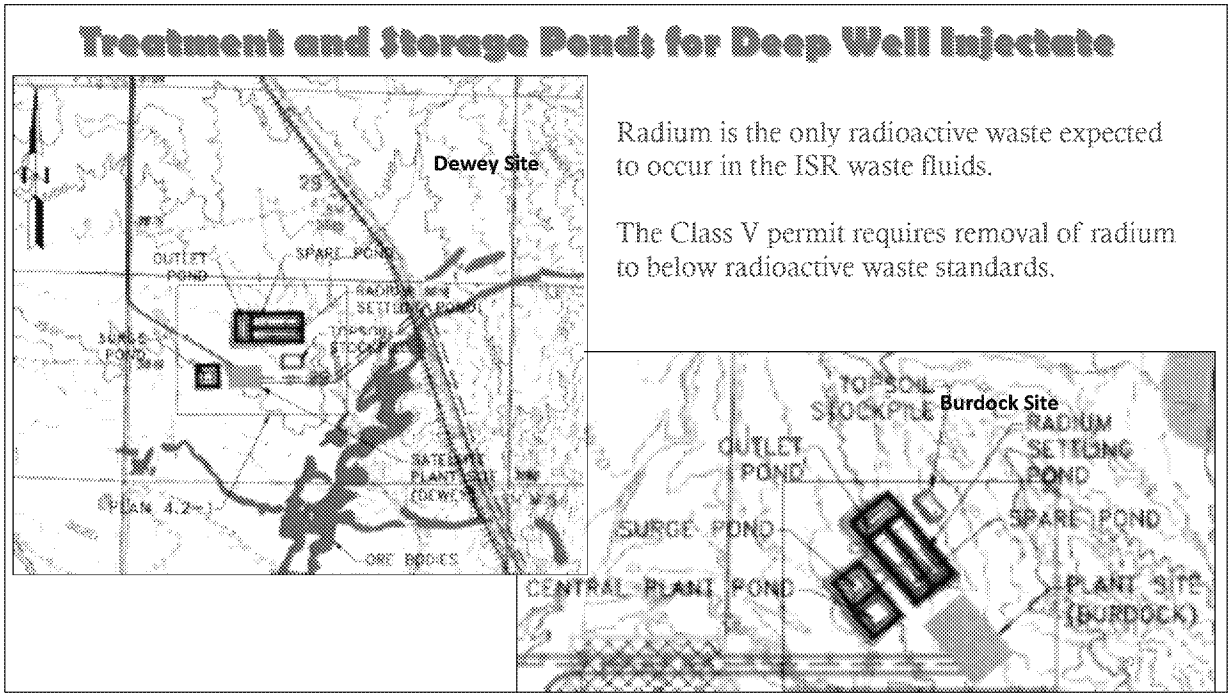
The Sun #1 Lance Nelson is located near the proposed location for DW No. 1. Minnelusa aquifer samples from the Sun #1 Lance Nelson show TDS values ranging from 16,652 to 21,391 mg/L. Based on this information and the fact that the Minnelusa porosity zone contains the soluble mineral anhydrite, the Minnelusa aquifer is not expected to be a USDW.



Point out injection zones and confining zones. Immediate confining zone (the Opeche) is 95 feet thick, but the overlyhing Minnekahta and Spearfish Formations are also confining zones.
The potential for seismicity to occur from injection into the Minnelusa. Point is low, because the Minnelusa is not directly overlying the Precambrian basement. In places like OK, AR & CO where injection-induced seismicity occurs, the injection zones are directly above the Precambrian basement.



Emphasis the ponds are for treatment and storage of Class V injectate. They are NOT infiltration ponds and NOT evaporation ponds.

EPA Dewey-Burdock Permit Process: Tribal Consultation

EPA's Policy is to consult on a government-to-government basis with federally recognized tribal governments when EPA actions and decisions may affect tribal interests.

The EPA views Consultation as a process of meaningful communication and coordination between EPA and tribal officials prior to EPA taking actions or implementing decisions that may affect tribes.

EPA Tribal Consultation Actions to Date and Plans for next steps:

- The EPA held informational meetings with all Tribes with possible interest in site.
- The EPA held "Inform & Educate" sessions to provide background information and opportunity for questions and discussion.
- Letters mailed November 25, 2015 providing notification of opportunity for formal consultation with EPA
- 8 tribes contacted the EPA expressing interest in government to government consultation.
- The EPA would like to continue consultation with interested tribes. (We have been contacted by 2 tribes so far.)

During our consultation meetings before draft permit issuance the EPA realized that we could not answer questions about how the permits would protect groundwater and surface water, because we could not discuss the permit conditions. Now that the draft permits have been issued, we can answer those questions.

The National Historic Preservation Act Process

EPA's plans for addressing NHPA obligations:

- Consider the effects of the whole undertaking on historic properties, not just EPA-regulated activities.
- Consult with tribes (and others) during our review.
- Tribes possess special expertise in assessing eligibility of historic properties that possess religious and cultural significance.
- Seek Tribal input on identification of traditional cultural properties, determination of adverse affects and ways to mitigate the adverse affects.

A draft document discussing the EPA NPHA 106 Process for the Dewey-Burdock is available on the EPA website at: https://www.epa.gov/sites/production/files/2017-03/documents/draft_national_historic_preservation_act_.pdf

As discussed in this document EPA has the option of designating the NRC as the lead for this process, or conducting the review ourselves.

- The EPA is reviewing the historic properties information developed in the NRC process.
- This information is available to the public at http://adams.nrc.gov/ehd.

EPA Documents and Contact Information

- All documents made available for public comment can be found on EPA Region 8's website: https://www.epa.gov/uic/uic-epa-region-8

- Douglas Minter
  minter.douglas@epa.gov
  (303) 312-6079

- Valois Shea
  shea.valois@epa.gov
  (303) 312-6276